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REPORT ON INDUSTRIAL WASTE DISCHARGE FROM INDUSTRIES AT MONSANTO

MONSANTO--Industrial waste discharge

Date------March 6, 1942

Interviewed--Mr. McCurdy, City Engineer for the Village of Monsanto

Mr. McCurdy wished to inform the Sanitary Water Board of work being done on sewers carrying industrial wastes from the industries in Monsanto to the Mississippi River. He stated that under certain conditions it might be necessary to discharge these wastes to a creek running through a residential area outside of the village limits. If this should happen, the residents in this area might complain to the Board; and, therefore, Mr. McCurdy wanted us to be acquainted with the situation.

Industries located in the village are:

Monsanto Chemical Co.
American Zinc Co.
L. Lubrite Refining Co.
Lewin Metals Reclaiming Co.
Sterling Steel Corp.
Midwest Rubber Reclaiming Co.
Federal Chemical Co.
U. S. Chemical Warfare Service
Darling Fertilizer Co.
Union Electric Power Co.

The power plant contributes no industrial wastes, but pays practically 60% of the taxes.

The village plans and expects to construct a new sewer parallel to the old one carrying wastes to the river. Wastes will be collected in a pumping station and discharged through this new line which is 57 1/2 X 56 inches cross-sectional area, and which is lined with vitrified tile plates to prevent rapid deterioration from acids.

Levels are such that when the river stage is less than 15 feet waste will flow by gravity. At present, waste discharge amounts to approximately 1500 g.p.m. but it is expected that this will be increased by 3000 g.p.m. With the increased quantity and a high river stage, It is probable that, when the wastes are being pumped to the river, a rupture might occur in the discharge line. It was predicted that if the river stage reached a 40-foot-gauge reading, rupture might occur. In case of such rupture or in the case of failure of the two pumps that are being provided, it would be necessary to discharge wastes to an open ditch that flows south through the Village of Kahokia and thence to the river.

Several years ago some wastes were discharged to this open ditch flowing south and the industries at Monsanto were sued by those residents living between the villages of Monsanto and Kahokia. At that time the industries were required to pay complainants $4,000.00. Mr. McCurdy stated that, because of war activities, the industries would not be able to shut down, should the main sewer line become unavailable for discharge of wastes; and that, regardless of complaints received, it would then be necessary to discharge wastes through this ditch draining toward Kahokia. This ditch is kept clean and receives raw sewage from those persons living close to it who would normally be the complainants. It is felt that even though industrial wastes would have a slight odor their discharge to the ditch would be beneficial since the great volume of water would flush settled solids into the Mississippi River.

The industries are financing this new sewer, which will cost approximately $200,000.00, and the third reading of the bond issue was recently read. It is expected that a contract will be let in April and that work should be started by May 1.

Mr. McCurdy reported that Monsanto Chemical Co. makes regular tests on the wastes passing through the present pump house. He does not know what these tests are or for what purpose they are made. It was stated that the present outfall extends a considerable distance into the river and discharges at a zero river gauge. It is usually under water, and wastes are well mixed with the river water in a short distance.

Wm. A. Hasfurther
Senior Sanitary Engineer

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Midwest Rubber Reclaiming Company

Interviewed: D. V. Topper, Plant Superintendent; C. K. Trimble, Executive Vice President.

Reclaimed rubber is produced in this plant. In the process, old rubber, principally from discarded automobile tires, is heated in autoclaves with a 6 per cent caustic solution or a zinc chloride solution of less than 1 per cent concentration. The charge from the autoclaves is dropped into a magazine tank where water is added. The suspension of rubber and water is screened, the rubber being removed from the screens for sales or dry processing and the water being dumped into settling tanks. After the settling period in these tanks, the supernatant is drained to the sewer and the sludge is discharged to a Dorr clarifier for further settling and decanting. Water overflowing from the Dorr clarifier is discharged to the sewer and the remaining sludge is discharged to an Oliver filter. Water removed in the filter is discharged to the sewer and the rubber is either dry processed or sold as is. In the process certain compounds such as pine tar, naptha, sulfides and polysulfides may be added. These are added in very small amounts and it is doubtful if they would be in sufficient amounts to cause taste in fish in the Mississippi River. The total waste volume from the plant is approximately 1.6 mgd.

While it appears doubtful that Midwest Rubber Reclaiming Company wastes are responsible for taste in fish in the Mississippi River, it is possible that these wastes may be responsible. It is recommended that samples be collected of waste waters from Midwest Rubber Reclaiming Company in order to further investigate the possibilities of their wastes causing tastes in fish.

NOTES ON INSPECTION OF INDUSTRIES AT MONSANTO

Dates August 4 and 5, 1947

All of the industries connected to the Monsanto village sewer were contacted on the above dates to determine the type process employed and the type wastes discharged so that the effect that the wastes might have in causing taste in fish in the Mississippi River might be assessed.

Lewin Metals Company

Interviewed: M. H. Marr, Plant Superintendent; J. W. Goldemberg Plant Engineer

Operations at Lewin Metals Company Monsanto plant consist of the refining and smelting of copper. Manufacture of seamless copper tubing is also carried on in this plant. No process wastes are discharged to the sewer, with the exception of the overflow water from the cooling pond. This water should contain nothing that would be detrimental to the river or cause tastes in fish.

Sterling Steel Casting Company

Interviewed: R. O. Shive, Plant Manager and President

The entire operation of this plant consists of steel casting. The only process wastes charged to the sewer consist of cooling waters from the electric furnaces, compressors, and air-conditioning system. These wastes have no detrimental effect on the river.

Darling and Company

Interviewed: F. B. Bliss, Plant Superintendent

Darling and Company manufactures fertilizer at the Monsanto plant. The process consists of the acidulation of phosphate rock and and the subsequent blending of the rock with nitrates, lime, etc., to meet the individual specifications for fertilizer. The only point in the process from which liquid wastes are discharged to the sewer consists of the washing of gases from the acidulation process. These gases are washed by a water spray in a tower and the overflow from the bottom of the tower discharges to the sewer. While no definite determination of the volume of water used in this plant was obtainable, it is understood to be quite small. Mr. Bliss advised that only a 2-inch water line supplies all of the water needs of the plant.

It appears doubtful that wastes from Darling and Company are responsible for tastes in fish in the Mississippi River, and it is believed that this plant can be dropped from further consideration.

American Zinc Company of Illinois

Interviewed: L. P. Davidson, Plant Superintendent

The process at American Zinc Company Monsanto plant consists primarily of the electrolytic refining of zinc. The raw material at the plant consists of zinc oxide which is dissolved in sulfuric acid and settled. The sludge is further refined for the removal of copper, cobalt, etc. The residue sludge from this process is piled on company property and does not enter the sewer. The liquid residue remaining after the removal of [illegible] materials consists of a solution of zinc sulfate and is

returned to the original process. The zinc dissolved in sulfuric acid is in the form of zinc sulfate here also. Zinc is removed from the zinc sulfate solution electrolytically. Oxygen is given off to the atmosphere. Pure zinc is plated out and the sulfuric acid remaining is returned to the head end of the process where it is reused to dissolve more zinc oxide.

The only liquid wastes from the process consist of spills and a large volume of cooling water used in the electrolytic cells. This volume consists of about 1,100 gallons per minute.

It would appear that wastes from American Zinc Company plant are not responsible for tastes in fish and that this plant may be dropped from further consideration.

Socony Vacuum Oil Company Refinery

Interviewed: C. P. Baker, Plant Manager; W. F. Fuhrhop, Industrial Relations Manager; and, John W. Borders.

This plant is an oil refinery. Only topping and cracking of crude oil is carried on at this plant. No lube oil processing or other specialized refinery processes are used. The plant capacity is nominally 21,000 barrels of oil per day, however, present operations were at a rate of 28,000 barrels per day. The high rate was possible due to the conversion of a catalytic cracking unit to straight distillation.

Sweet crude only is refined at this plant. As a result, no acid sludges are produced. Caustic treating solution that is no longer fit for use in the process is collected in a tank at the refinery and is sold to a chemical company for processing and the removal of phenols. No caustic solutions are normally discharged to the sewer. Water wash

from the treatment of gasoline amounts to sixty to ninety gallons per minute.

The entire wastes from this refinery are discharged through an API separator for removal of oils. Waste volume was stated to be approximately 800 gpm. The pH of waste water discharged was stated to be 9.0. The refinery checks the operation of the separator by running determinations for oil, total solids, dissolved solids, suspended solids, and pH.

It would appear from the nature of the operation that Socony Vacuum Oil Company Refinery is not responsible for discharging wastes which might cause tastes in fish in the Mississippi River. However, it is possible that the wastes discharged may contribute to the tastes in fish and it is recommended that their process be further investigated by the collection of samples of the wastes discharged.

J. T. Moss Tie Company

Interviewed: R. C. Studebaker, Assistant Plant Superintendent

The Moss Tie Company plant operation consists of the impregnating of railroad ties, telegraph poles, etc., with asphaltic compounds. The operation at this plant is identical with that carried on at their Mt. Vernon, Illinois plant. All process wastes are discharged to a lagoon where they seep into the soil. Sanitary wastes are discharged to a cesspool. Moss Tie Company has no connection with the Monsanto village sewer.

Since Moss Tie Company is obviously not responsible for the discharge of wastes to the Mississippi River which might cause tastes in fish, it is recommended that they be dropped from further consideration.

Monsanto Chemical Company

Interviewed: F. M. Berkey, Service Superintendent

Mr. J. F. Stickley, Assistant Plant Manager, was on his vacation at the time of the inspection and, as a result, no information could be obtained regarding the present status of investigation by Monsanto Chemical Company into their process, in an attempt to evaluate the properties of their wastes which might cause tastes in fish. Mr. Berkey advised that Monsanto Chemical Company was entirely agreeable to any sampling program which we might deem necessary to determine the effect of their wastes on the river.

Recommendations

From a survey of all of the above-listed industries, it would appear that the only ones which might be considered as being at all responsible for the discharge of wastes which might cause taste in fish are Midwest Rubber, Socony Vacuum, and Monsanto Chemical Company. It is recommended that samples be collected from the outfall sewers of all three plants in order to evaluate the effect of their wastes.

A. P. Troemper
Principal Sanitary Engineer

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